

STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Entergy Nuclear Vermont Yankee)
and Entergy Nuclear Operations, Inc., pursuant to)
30 V.S.A. §248, for a Certificate of Public Good)
to modify certain generation facilities)

Docket No. 6812

Prefiled Direct Testimony of

William Sherman

on behalf of the

Vermont Department of Public Service

May 9, 2003

Summary: Mr. Sherman summarizes his review of the proposed power uprate and presents the
Department's conclusions.

Direct Testimony
of
William Sherman

1 Q. Please state your name and occupation.

2 A. My name is William Sherman, and I am an engineer with the Department of Public Service
3 (“The Department”). My responsibilities include oversight for the state of the activities of the Vermont
4 Yankee Nuclear Power Station and the nuclear power industry in general.

5

6 Q. Please describe your educational background and experience.

7 A. I have a B.S. Degree in Mechanical Engineering from The University of Michigan. I have been
8 with the Department for over fourteen years in the position of nuclear engineer. Prior to coming to the
9 Department I had 18 years of licensing, engineering, and design experience in the nuclear industry. I
10 am a registered professional engineer in three states.

11

12 **INTRODUCTION AND SUMMARY OF TESTIMONY**

13 Q. What is the purpose of your testimony?

14 A. My testimony summarizes my review of the petition of Entergy Nuclear Vermont Yankee,
15 LLC and Entergy Nuclear Operations, Inc. (jointly “Entergy”) for a certificate of public good to
16 increase its power output by approximately 20% (“power uprate”).

1

2

3 Q. What are your conclusions regarding the proposed power uprate?

4 A. Having reviewed Entergy's evaluation of the criteria for a certificate of public good, I have
5 comments on the following areas. Both the benefits and costs of the proposal are small. However,
6 more information is necessary to determine if the proposal results in a benefit to the state and its
7 residents. It appears there are a number of ways in which Entergy can demonstrate the proposal will
8 result in a benefit to the state and its residents.

9

10 Q. Please describe Entergy's petition for proposed power uprate.

11 A. The proposed power uprate is described by Entergy Witness Thayer on pages 5 and 10-12 of
12 his direct testimony.¹ Entergy proposes to increase its gross generation by approximately 110 MW
13 (an approximately 20% increase in power output). The power uprate would be accomplished through
14 modifications of the existing Vermont Yankee Nuclear Power Station ("VYNPS") without changing
15 the physical layout of the station or the surrounding landscape. The VYNPS fuel management
16 program will be modified to provide nuclear fuel which will generate approximately 20% more energy
17 during the 18 month fuel cycle. This will result in additional spent fuel assemblies as shown on Witness

¹ Mr. Thayer's description is a summary of information pertinent to the matters of this proceeding. A detailed description of the project along with a full safety evaluation will be provided in Entergy's NRC application scheduled for submittal to the NRC in September 2003.

1 Thayer's exhibit EN-JKT-6. Reactor pressure will remain at its current operating values, and steam
2 and feedwater flow through the reactor will be increased to create the additional power. Equipment
3 throughout the station will be modified, as identified by Witness Thayer, to create the additional steam
4 and feedwater flow and to recover the additional energy from these higher flow rates.

5
6 Q. Please describe the history of power uprates.

7 A. Power uprates are marketing ventures by the nuclear reactor vendors (called nuclear steam
8 supply system (NSSS) vendors). The NSSS vendors own the safety analysis calculations which
9 pertain to the nuclear systems and they are the only ones with the expertise to modify and resubmit
10 these calculations.

11 The NSSS vendors modify their generic safety analyses for higher power levels and get them
12 approved by the NRC. Then they offer the package to utilities. General Electric (GE) is the NSSS
13 vendor for Vermont Yankee and all boiling water reactors (BWRs).

14 There have been three stages of power uprates:

- 15 * stretch power uprates
- 16 * measurement uncertainty recapture power uprates
- 17 * extended power uprates

18 Stretch power uprates are typically 5-percent and usually involve changes to instrumentation
19 setpoints, but do not involve major plant modifications since plants were originally designed for 5%

1 greater operation. This is especially true for boiling-water reactor plants. These were the first uprates
2 offered, starting in the late 70's and through the 80's.

3 Measurement uncertainty recapture power uprates are less than 2-percent and are achieved
4 by implementing enhanced techniques for calculating reactor power. This involves the use of
5 state-of-the-art feedwater flow measurement devices that reduce the degree of uncertainty associated
6 with feedwater flow measurement and, in turn, provide for a more accurate calculation of power.
7 These uprates started in the 1999 and are continuing to this date.

8 Extended power uprates (EPUs) are usually greater than stretch power uprates and have been
9 submitted for increases in reactor power as high as 20 percent. These uprates usually require
10 significant modifications to major balance-of-plant equipment such as the high pressure turbines,
11 condensate pumps and motors, main generators, and/or transformers. GE's first offering for EPU was
12 approved in 1998, an 8% increase (total of 13% counting a previous stretch power uprate) in Georgia
13 Power's Hatch Units 1 & 2. By 2000, GE had secured generic approvals of its calculations from the
14 NRC in order to offer a standard EPU product offering to BWR plants of up to 20% increased
15 power.

16 GE's calculations demonstrate the acceptability of the nuclear reactor systems up to 20%
17 EPU. Specific utilities evaluate the non-nuclear portions of their plants and any environmental impacts
18 to determine the cost effectiveness of different levels of uprate.

1 Within the period from November 2001 to May 2002, eight BWR plants at five sites had
2 accepted this GE proposal and received approval from NRC to implement an EPU of up to 20%.
3 The oldest plants in this category are Exelon's Dresden Units 2 and 3, which began operation in 1970
4 and 1971, two and one year, respectively, older than Vermont Yankee.

5
6
7 Q. Please describe how is the power increased in power uprate?

8 A. In the reactor there is a set limit for the highest temperature allowed for the fuel. This highest
9 temperature occurs in the middle of the core. Temperature drops off toward the sides of the core in
10 an "umbrella shape." This also means that the highest rate of power is produced in the center of the
11 core, and power production drops off as you go toward the sides of the core.

12 Power uprate is achieved by loading more "active" fuel around the sides of the core. The
13 highest fuel temperature in the center remains the same, but the temperatures (and power production)
14 as you go toward the sides of the core are greater (the umbrella shape is flatter). This results in more
15 power production. GE's generic calculations have demonstrated that the reactor can operate within
16 safety margins for this flatter power curve.

17 The process of loading more "active" fuel around the sides of the core is the reason more
18 spent fuel is generated - the fuel assemblies around the edge are replaced at a more frequent rate than
19 currently.

1 In order to remove this power from the reactor, the flow of water into the reactor (feedwater
2 flow) and the flow of steam from the reactor (steam flow) are increased. This is accomplished in a
3 manner so that overall reactor vessel pressure (and therefore steam line pressures) are not increased.
4 Feedwater flow is increased by using an additional feedwater pump (or increasing the size of
5 feedwater pumps). Steam flow is increased by modifying the turbine control valves or turbine inlet
6 nozzles to admit more steam into the turbines.

7 The turbines must be modified (or replaced) to accept more steam flow and the generators
8 rewound to convert the rotary turbine energy into greater amounts of electricity. Other related plant
9 equipment is reviewed to determine that the equipment designs meet the requirements of upgraded
10 conditions. For example, the Vermont Yankee power uprate will require changing several large
11 feedwater heaters to accommodate additional flows.

12
13 Q. Besides this present docket, what other approvals are associated with the proposal?

14 A. Entergy must receive approval from the Nuclear Regulatory Commission (NRC) to increase
15 its licensed power output above its current amount. NRC reviews and approves the nuclear safety
16 aspects of the proposal. Entergy plans to submit its NRC application in the third quarter of 2003 and
17 has requested a decision from NRC by July 2004. According to NRC regulations, Entergy may make
18 modifications to the plant at its own schedule, but Entergy may not actually operate at increased power
19 levels until NRC approval is given. Thus, Entergy plans to make the majority of uprate modifications

1 during its Spring 2004 refueling outage, but will not operate at increased power levels until Fall 2004
2 when NRC approves its application.

3 Entergy has also submitted an application to ISO-NewEngland for an assessment of the
4 impact of the proposal on the transmission system. The results of this assessment are scheduled for
5 September 2003.

6 Entergy has also submitted an application to the Vermont Agency of Natural Resources
7 (ANR) to amend its current NPDES permit to increase VYNPS's thermal discharge limits. Entergy
8 states that this request is not necessary for the power uprate proposal, but will allow VYNPS to
9 generate more energy if it is granted. If the NPDES amendment were not granted, VYNPS would
10 require using onsite cooling towers more frequently at the uprated power level.

11
12 Q. Why does Entergy use the word *approximately* when referring to the increase in power from the
13 power uprate?

14 A. There are several reasons Entergy characterizes the power increase as *approximate*. First,
15 Entergy will modify equipment to produce the targeted power uprate amount of 20%. However, the
16 actual power increase will not be known until tests are run with the newly installed equipment.
17 Second, the NRC review of power uprate will be comprehensive and all the analysis work necessary
18 to provide to the NRC has not yet been completed. NRC review could result in an uprate amount less

1 than 20%. Third, as identified by Witness Thayer at page 8 of his direct testimony, the results of the
2 ISO-New England study could result in choosing an uprate amount less than 20%.

3
4 Q. Are there special schedule considerations associated with Entergy's petition?

5 A. Yes. Entergy is requesting the Board's approval by October 31, 2003 in order to perform
6 cooling tower modifications during Fall 2003 to be ready for power uprate operation in the Fall 2004.
7 These cooling tower modifications need to be performed outside of the summer months when the
8 cooling towers are used. Thus, Entergy is requesting a Board decision prior to approval of the uprate
9 by NRC, possibly even prior to submittal of the NRC application, and possibly prior to completion of
10 ISO-New England's transmission stability assessment.

11
12 Q. Do you have comments regarding the schedule considerations?

13 A. Yes. The consideration of an amended NPDES permit by ANR need not hinder the Board's
14 consideration since the power uprate can proceed without the NPDES permit amendment.

15 Also, the completion of ISO-New England's transmission stability assessment need not hinder
16 the Board's consideration of the issue of system stability and reliability, 30 V.S.A. § 248 (b)(3). The
17 ISO-New England assessment can be relied upon to demonstrate the proposal will not adversely
18 affect system stability and reliability. If adjustments to the transmission system are required, Entergy
19 has committed to either make the adjustments, which would include separate Board review, or to

1 scale back the magnitude of the power uprate. The Board's approval, if granted, can be conditioned
2 on future completion and resolution of ISO-New England's transmission stability assessment.

3 The same is true of the NRC's safety review. At the Board's public hearing of April 29,
4 2003, a high percentage of speakers expressed concern over safety issues. In order to grant power
5 uprate, the NRC staff will perform a detailed review of a high volume of material. There are typically
6 multiple rounds of questions and answers. The result will be a safety evaluation report (SER) which
7 identifies the bases for granting the uprate in each technical area. Attached as Exhibit DPS -WKS-1 is
8 the table of contents for the power uprate SER dated May 31, 2002, for Carolina Power and Light's
9 Brunswick Steam Electric Plant, Units 1 and 2² ("Brunswick SER"). The entire 140 page Brunswick
10 SER can be found at the following location on the NRC's website:

11 [http://www.nrc.gov/reactors/operating/licensing/power-uprates/](http://www.nrc.gov/reactors/operating/licensing/power-uprates/pwrup-files/brunswick-may-31-2002.pdf)
12 [pwrup-files/brunswick-may-31-2002.pdf](http://www.nrc.gov/reactors/operating/licensing/power-uprates/pwrup-files/brunswick-may-31-2002.pdf)
13

14 A review of the Exhibit DPS-WKS-1 or the Brunswick SER itself shows the NRC's review is
15 comprehensive. If the NRC approves the license amendment for power uprate, NRC will find that
16 "(1) there is reasonable assurance that the health and safety of the public will not be endangered by
17 operation in the proposed manner, (2) such activities will be conducted in compliance with the

² The Brunswick Steam Electric Plant, Units 1 and 2, are BWR units of the same vintage and similar design as Vermont Yankee. Their reactors are larger than Vermont Yankee's (560 vs. 368 fuel assemblies in the core), but otherwise the design features are similar. The units came on line in 1975 and 1977, respectively.

1 Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common
2 defense and security or to the health and safety of the public." Brunswick SER, p. 128.

3 Also, in my opinion there is little likelihood NRC's review will modify issues associated with
4 the certificate of public good criteria. Therefore, the Board's approval, if granted, can be conditioned
5 on future NRC approval.
6
7
8

9 Q. Please provide a brief summary of your review.

10 A. Since VYNPS already exists and since the investment risk associated with the modifications
11 for power uprate would be borne by Entergy and not ratepayers, there are few impacts. I have
12 specific comments regarding the need and economic benefit criteria, 30 V.S.A. §248 (b)(2) and 30
13 V.S.A. §248 (b)(4).
14

15 Q. What are your comments on the economic benefit criterion, 30 V.S.A. §248 (b)(4)?

16 A. The most common manner to show an economic benefit is to demonstrate that Vermont
17 ratepayers will receive additional power at a favorable price. Entergy is required to offer Vermont
18 Yankee Nuclear Power Corporation (VYNPC) a commercially reasonable opportunity to negotiate
19 for uprate power, but has not yet extended such an offer. Using historical capacity factors and
20 refueling outage durations, it appears that the cost to Entergy per megawatt-hour of uprate power is in

1 the order of \$20/MWh or 2.0 cents per kWh. . Therefore, it appears Entergy has the ability to
2 provide Vermont ratepayers with at least a portion of uprate power at a favorable price.
3

4 Q. In the answer above you state that Entergy must offer VYNPC the opportunity to negotiate. If the
5 negotiation is with VYNPC, how would benefits of favorable priced uprate power flow to Vermont
6 ratepayers?

7 A. Vermont utilities, Central Vermont Public Service (CVPS) and Green Mountain Power
8 (GMP) together are the major owners of VYNPC. Power purchased by VYNPC flows through to its
9 owners through existing contracts approved by the Federal Energy Regulatory Commission (FERC).
10 Even if VYNPC's out-of-state owners did not wish to purchase uprate power, an agreement could be
11 structured to provide uprate power at favorable prices to CVPS and GMP. In addition, it's possible
12 Entergy could consummate an agreement for favorably priced uprate power directly with Vermont
13 utilities.
14

15 Q. What if CVPS and GMP did not need additional energy and capacity to serve their retail customers?

16 A. If the energy and capacity from power uprate were favorably priced, CVPS and GMP could
17 take the power from VYNPC or Entergy and resell the energy and capacity on the market at a profit
18 to the benefit of Vermont ratepayers.
19

1 Q. Since Entergy is not providing a direct benefit to Vermont ratepayers in terms of favorably priced
2 uprate power, how does Entergy attempt to demonstrate that power uprate will create a benefit to the
3 state and its residents?

4 A. Entergy Witness Lesser identifies benefits as:

- 5 1. Additional tax collections (at pages 5 and 17);
- 6 2. A possibility of lower electricity to the extent that Vermonters are exposed to market
7 costs which will be incrementally lower due to the incremental addition of uprate
8 power to the market. (pages 5, 10-13, and 23-25).

9 In addition, Witness Lesser identifies other items on pages 5 and 17-23 which may have some
10 beneficial aspects. I agree that potential additional tax collections are a benefit of the proposed uprate.
11 However, incrementally lower market power costs would be benefits only if Vermont utilities were net
12 power buyers instead of sellers on the market. Witness Lesser has not provided documentation or
13 analysis to show whether Vermont utilities are net buyers or sellers on the market.

14
15 Q. Has Witness Lesser identified costs associated with the proposed power uprate?

16 A. Yes, although not all of them. At page 6, he states:

17 Entergy Nuclear VY and its investors will bear all of the [monetary] risk
18 associated with the uprate . . . it does not appear that the State of Vermont
19 will bear any indirect monetary costs from the proposed uprate . . . there is no
20 evidence of any non-monetary, environmental costs from the development of
21 the uprate.

1 Witness Lesser further elaborates on costs on pages 25-30 of his direct testimony. However,
2 he does not consider costs associated with the extended duration of refueling outages necessary for
3 power uprate modifications, the possibility of costs associated with forced outages associated with
4 power uprate, the possibility of costs associated with requiring additional nuclear fuel storage 18
5 months earlier with power uprate, and possible costs associated with changes caused by power uprate
6 to the locational marginal pricing (LMP) structure in the standard market design (SMD). In addition,
7 Witness Lesser does not consider the environmental, societal cost associated with the generation of
8 additional radioactivity and radioactive waste as stated by Witness Thayer at pages 15-16.

9
10 Q. Please describe the unidentified cost associated with extended refueling outages and forced outages.

11 A. The modifications for power uprate identified by Entergy Witness Thayer on Exhibit EN-JKT-
12 4 are extensive and have the possibility of extending either the 2004 or 2005 refueling outages.
13 Witness Thayer, at 12, states that most of the modifications will be installed in the 2004 outage which
14 is scheduled for less than 30 days. VYNPS's last two refueling outages were 21 days in 2002 and 23
15 days in 2001. Assuming an LMP for Vermont Yankee of \$50 per MWh³, the difference in cost per

³ The value of \$50 per MWh is chosen for illustrative purposes only and is not the result of any forecast. If the LMP's were higher than \$50 per MWh, the impacts would be greater. If the LMPs were lower, less. If the LMP's were below \$42.80, purchase of power on the market would be more advantageous than receiving power through the power purchase agreement.

1 day for VYNPC owners to purchase power on the open market instead of from the power purchase
2 agreement would be approximately \$88,000 per day.⁴

3 In addition, plants similar to Vermont Yankee which have implemented 20% power uprates
4 have experienced forced outages and power reductions as a result of the modifications made for
5 power uprate. These forced outages have the possibility of creating costs for Vermonters.

6
7
8
9 Q. Do you believe it's possible for Entergy to mitigate the possibility for costs to Vermonters as a result of
10 extended refueling outages and forced outages resulting from power uprate?

11 A. Yes, I believe Entergy would be able to execute agreements to protect Vermonters from costs
12 which could result from extended refueling outages and forced outages from power uprate
13 modifications.

14
15 Q. Please describe the potentially unidentified cost associated with requiring additional spent fuel storage
16 18 months earlier.

17 A. Witness Lesser, at 29, states that there will be no costs associated with requiring additional
18 spent fuel storage capacity 18 months earlier with power uprate because Entergy will pay all expenses

⁴ Vermont utilities' share of these amounts is approximately 55%.

1 associated with providing temporary dry fuel storage. In this statement, Witness Lesser implicitly
2 assumes authorization for dry cask storage will be granted. However, Witness Lesser does not
3 discuss the consequences if authorization for dry cask storage is not granted.

4 If authorization for dry cask storage were not granted, it can be assumed that VYNPS would
5 permanently cease operation⁵ 18 months sooner with power uprate, thereby depriving Vermont
6 Utilities of the benefit of the power purchase agreement for these 18 months. If replacement power
7 prices for the specific 18 month period are higher than the power purchase agreement, there would be
8 a cost created by power uprate.

9
10 Q. Do you believe it's possible for Entergy to mitigate the possibility for costs to Vermonters as a result of
11 dry cask storage not being authorized?

12 A. Yes. I believe it is possible for Entergy to execute agreements which would provide
13 Vermonters protection if dry cask storage were not authorized and if outyear LMPs were higher than
14 power purchase agreement prices.

15
16 Q. Please describe the potentially unidentified cost associated with changes to Vermont's LMPs caused
17 by the proposed power uprate?

⁵ Permanent cessation of operation is an assumption. It may be possible for Entergy to employ measures other than dry cask storage to create the necessary spent fuel storage capacity and therefore to continue operation.

1 A. Entergy proposes to input up to 120 MW of additional power at the Vermont Yankee Node
2 of ISO-New England's SMD. This has the potential of changing the loss and congestion components
3 of the LMP in the Vermont Yankee node, in other Vermont nodes and in the Vermont Zone. These
4 incremental changes to loss and congestion components, if they occur throughout Vermont, have the
5 potential of creating either a benefit or a cost to Vermonters. However, Entergy has not provided an
6 evaluation of how these components will be affected by the proposed power uprate, and whether a net
7 benefit or a net cost for Vermonters will result.

8
9 Q. You also mentioned earlier that Witness Lesser did not consider the environmental, societal cost
10 associated with the generation of additional radioactivity and radioactive waste as stated by Witness
11 Thayer at pages 15 -16. Do you have comment on this area?

12 A. Yes. Witness Lesser makes statements on pages 29-30 of his direct testimony on the
13 adequacy of radioactive waste *storage*. He does not comment on the broader societal issues related
14 to the generation of additional radioactive waste.

15 The societal issues associated with additional radioactive waste generation have not been
16 quantified in the manner that gas emissions from fossil fueled plants have been quantified. High- and
17 low- level radioactive wastes are different from gas emissions in that gas emissions go directly into the
18 environment while radioactive wastes are kept from the environment in licensed disposal facilities.
19 Low-level radioactive waste disposal facilities exist, and the federal government has made identifiable
20 progress in the development of a high-level radioactive waste repository with the selection by the

1 Congress of the Yucca Mountain site in Nevada. These disposal facilities must meet specific NRC
2 requirements for exposure limits to members of the public. Since the NRC exposure limits will not be
3 modified as a result of the proposed uprate, and since the incremental additional waste generation will
4 be small compared with the radioactive waste that already exists, the societal costs associated with
5 additional radioactive waste generation from power uprate is small and not a significant consideration
6 for the 248 criteria.

7 I would also like to note that a high percentage of the comments in the Board's public hearing
8 of April 29, 2003, expressed concern over the generation of additional high-level radioactive waste.
9 However, it does not appear the incremental amount of waste generated will result in identified
10 impacts, whether stored in spent fuel pool storage or dry cask storage.⁶ I consider the selection by
11 the President and the Congress of the Yucca Mountain site in Nevada as the site for a license
12 application to be a demonstration of significant progress toward development of a repository.

13
14 Q. What is your conclusion regarding the economic benefit criterion, 30 V.S.A. §248 (b)(4)?

15 A. The benefits and costs associated with the proposed uprate are small. It is possible that costs
16 associated with extended refueling outages, forced outages, inability to implement dry cask storage
17 and changes to the SMD pricing may be greater than the benefits from additional taxes and

⁶ The most significant impact appears to be that, without authorization of dry cask storage, the plant would shutdown 18 months earlier if power uprate is granted. This has been discussed earlier in this testimony.

1 incremental market price reductions. Entergy has the ability to create conditions that will guarantee
2 there will be a net benefit to the state and its residents from the proposed power uprate.

3
4 Q. What are your comments on the need criterion, 30 V.S.A. §248 (b)(2)?

5 A. The need criterion statement of 30 V.S.A. §248 (b)(2) is:

6 [I]s required to meet the need for present and future demand for service which
7 could not otherwise be provided in a more cost effective manner through
8 energy conservation programs and measures and energy-efficiency and load
9 managements measures, including but not limited to those developed pursuant
10 to the provisions of sections 209(d), 218c, and 218(b) of this title.
11

12 Witness Lesser's conclusion, at page 9 of his direct testimony, regarding 30 V.S.A. §248
13 (b)(2) is that it solely applies to regulated electric and gas distribution utilities, and not merchant plants,
14 and that the Board should determine that it is not applicable in this proceeding.

15
16 Q. Has the Board found previously that a merchant plant application promoted the general good of the
17 State of Vermont?

18 A. Yes. In Docket No. 5323, the Board found that the Arrowhead Cogeneration Company,
19 L.P., project would promote the general good of the state of Vermont, subject to certain conditions
20 which subsequently were not met. In this case, Arrowhead proposed construction of a 28 MW gas-
21 fired cogeneration facility which would provide all of its electrical output to a New Hampshire utility on
22 a wholesale basis.

1

2 Q. Is this power uprate proposal a merchant plant proposal and do you consider it unique?

3 A. Yes, the proposal is a merchant plant proposal. It is unique because it is an existing plant
4 rather than a new plant proposal. Actually, the proposal is best viewed as an upgrade to make the
5 existing plant more efficient. Because it is a merchant plant proposal, ratepayers and consumers are
6 not exposed to the investment risk from uprate modifications. Because it is an existing plant, the
7 environmental impacts are minor and inconsequential in comparison to a new plant proposal.

8

9 Q. What conclusion regarding the need criterion, 30 V.S.A. §248 (b)(2), do you derive from the
10 uniqueness of the project?

11 A. The need criterion, 30 V.S.A. §248 (b)(2), was established 1) to protect ratepayers who
12 would be responsible for the costs of any projects proposed by utilities, and 2) to protect the
13 environment through encouraging development of environmentally preferable projects. The unique
14 nature of this project results in both of these criteria being met. Ratepayers are not exposed to
15 investment risk and environmental impacts are minor. Furthermore, 30 V.S.A. §248 (b)(2) was
16 crafted before the New England wholesale power pool was restructured and opened to wholesale
17 competition. The need criterion, 30 V.S.A. §248 (b)(2), did not anticipate development of “EWGs”
18 or a merchant plants that did not serve retail load. Therefore, the need criterion, 30 V.S.A. §248
19 (b)(2), should not be a reason for finding the proposal does not meet the public good of Vermonters.

1 Instead, making an existing plant more efficient for no ratepayer investment risk and minor
2 environmental consequence precisely meets the intent of 30 V.S.A. §248 (b)(2).

3
4 Q. In what manner is the power uprate proposal *needed*?

5 A. For a cost-of-service regulated utility, need is traditionally demonstrated by a shortfall of
6 present or future power for consumers within a retail service territory. Merchant plants are not
7 *needed* because they provide shortfall power to service territories, but rather are *needed* because they
8 have a reasonable likelihood of providing energy to the market at prices which will result in the project
9 being used.

10
11 Q. Does the proposed power uprate have a reasonable likelihood of providing energy at market prices
12 which will result in the uprate power being used?

13 A. Yes. Witness Lesser identifies that VYNPS is run as a base-load plant at pages 10-13 of his
14 direct testimony and at page 21 he states:

15 The generation produced by the uprate will always be sold into the wholesale
16 market since the plant is run as a baseload unit.

17
18 Once the capital costs of uprate are paid and become sunk, the variable costs associated with
19 uprate energy will be less than \$5/MWh, or ½ cent/kWh, which is low enough to direct that uprate
20 power would always be supplied under VYNPS's baseload. Therefore, there is a reasonable
21 likelihood of providing energy at market prices which will result in the uprate power being used.

1

2 Q. Do you have an additional observation regarding the need criterion, 30 V.S.A. §248 (b)(2)?

3 A. Yes. I note that the cost of the power generated by the uprate is less than at least one
4 measure of the cost of energy efficiency. I base this assertion on the following simple observation. In
5 this testimony I have concluded that the cost of the uprate power to Entergy is approximately 2
6 cents/kWh. In Docket No. 6777 the Board found the following: “In 2001, energy efficiency was
7 obtained by the EEU [Energy Efficiency Utility] at a cost of 2.6 cents per kilowatt-hour. . . .”
8 Docket No. 6777, Order of December 30, 2002, finding 7, at 10. While the 2.6 cents per kilowatt-
9 hour represents an average of implemented demand side management (DSM) initiatives, the cost for
10 power uprate power is well below the average. My expectation would be that the EEU’s average
11 DSM costs will only increase in the future, as lower cost initiatives are exhausted and higher cost
12 initiatives are explored.

13

14 Q. Do you have an additional comment from the Board’s public hearing of April 29, 2003?

15 A. Yes. A high percentage of speakers mentioned concern about local emergency planning and
16 evacuation considerations. The state of Vermont is responsible for emergency planning and is funded
17 by an amount set by the legislature. In 2002, the amount was increased from \$400,000 per year to
18 \$800,000 per year. Since that time, the Vermont Emergency Management Division has opened a full-
19 time staffed office in southern Vermont. The proposed power uprate modification does not directly
20 effect emergency plans and evacuation considerations. These plans and considerations must be in

1 place for the plant with its current power output and would not require modification as a result of
2 power uprate. Nevertheless, many of the local population were concerned about local emergency
3 planning and evacuation considerations.
4
5
6

7 Q. Finally, Mr. Sherman, Witness Lesser, at pages 14 and 33, refers to your support of power uprate in
8 PSB Docket 6120/6460. Is your support of power uprate in that docket relevant to this proposed
9 power uprate by Entergy?

10 A. No, not directly. In that case, the cost of the uprate power was very inexpensive and the
11 benefit of this inexpensive power went directly to CVPS and GMP, and therefore to Vermont
12 ratepayers. Witnesses Thayer and Lesser have not testified that Entergy commits to provide this
13 uprate power to CVPS and GMP at the two cents per kWh cost. However, my support of uprate in
14 Docket Nos. 6120/6460 shows that power uprate could be supported if there were an economic
15 benefit.
16

17 **CONCLUSION**

18 Q. What do you conclude regarding the proposed transaction?

19 A. In order to demonstrate the proposed uprate results in a benefit to the state and its residents
20 (10 V.S.A. §248 (b)(4)), it is necessary to have more information with regard to potential costs

1 associated with extended outage durations, forced outages, and the inability to implement dry cask
2 storage, as well as the affect the proposal would cause on congestion and loss components of
3 locational marginal pricing. It appears that it is possible for Entergy to create conditions which will
4 guarantee there is a net benefit. Finally, it may be possible for Entergy to assist toward addressing
5 public concerns regarding emergency planning and evacuation considerations. If these concerns were
6 resolved, the Department could recommend Entergy be granted a certificate of public good for the
7 proposed power uprate.

8
9 Q. Does this conclude your testimony?

10 A. Yes, it does.